

**ENVIRONMENTAL ASSESSMENT FOR PROPOSED ENERGY
CONSERVATION STANDARDS FOR COMMERCIAL
UNITARY AIR CONDITIONERS AND HEAT PUMPS**

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CONDITIONERS AND HEAT PUMPS**

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1.0 INTRODUCTION

The Department will assess the impacts of proposed commercial unitary air conditioner standard levels on certain environmental indicators using a variant of the U.S.DOE/Energy Information Administration (EIA)'s National Energy Modelling System (NEMS)^a. DOE/EIA uses NEMS to produce the *2003 Annual Energy Outlook (AEO2003)*.¹ The Department will use a variant known as NEMS-BT to provide key inputs to the analysis. Results of the environmental analysis are similar to those provided in *AEO2003*.

The Department intends the environmental assessment to provide emissions results to policymakers and interveners, and to fulfill requirements that the environmental effects of all new Federal rules be properly quantified and considered. The environmental analysis considers two pollutants, sulfur dioxide (SO₂) and nitrogen oxides (NO_x), as well as carbon emissions. The only form of carbon tracked by NEMS-BT is carbon dioxide (CO₂), so the carbon discussed in this report is only in the form of CO₂. For each of the standard levels, the Department will calculate total emissions using NEMS-BT, with external analysis used as needed.

The Department will conduct the environmental assessment as a policy deviation from the *AEO2003*, using the same basic set of assumptions. For example, the emissions characteristics of an electricity generating plant will be exactly those used in *AEO2003*. The NEMS reference case and alternative growth scenarios are as described in the utility impact analysis (Chapter 13 of the Technical Support Document).

2.0 METHODOLOGY

The NEMS-BT tracks carbon emissions using a detailed carbon module; this gives good results because of its broad coverage of all sectors and inclusion of interactive effects. Past experience with carbon results from NEMS suggests that the NEMS-generated emissions estimates are somewhat lower than estimates based on simple average factors. One of the reasons for this divergence is that NEMS tends to predict that conservation displaces renewable generating capacity in the later years of its forecast. On the whole, NEMS-BT provides carbon

^a For more information on NEMS, please refer to the U.S. Department of Energy, Energy Information Administration documentation. A useful summary is *National Energy Modeling System: An Overview 2000*, DOE/EIA-0581(2000), March, 2000. DOE/EIA approves use of the name NEMS to describe only an official version of the model without any modification to code or data. Because this analysis entails some minor code modifications and the model is run under various policy scenarios that are variations on DOE/EIA assumptions, we refer to it as NEMS-BT (BT is DOE's Building Technologies Program). NEMS-BT was previously called NEMS-BRS.

emissions results of reasonable accuracy, at a level consistent with other published Federal results.

The NEMS-BT model reports the two airborne pollutant emissions that DOE has reported in past analyses, SO₂ and NO_x. The Clean Air Act Amendments of 1990 set an SO₂ emissions cap on all power generation. The attainment of this target, however, is flexible among generators through the use of emissions allowances and tradable permits. The NEMS-BT model includes a module for SO₂ allowance trading and delivers a forecast of SO₂ allowance prices. Accurate simulation of SO₂ trading tends to imply that physical emissions effects will be zero, as long as emissions are at the ceiling. This fact has caused considerable confusion in the past. However, there is an SO₂ benefit from conservation in the form of a lower allowance price as a result of additional allowances from this rule, and, if it is big enough to be calculable by NEMS-BT, DOE will report this value. The NEMS-BT model also has an algorithm for estimating NO_x emissions from power generation. Two recent regulatory actions proposed by the EPA regarding regulations and guidelines for best available retrofit technology determinations and the reduction of interstate transport of fine particulate matter and ozone are tending towards further NO_x reductions and likely to an eventual emissions cap on nation-wide NO_x. 69 FR 25184 (May 5, 2004) and 69 FR 32684 (June 10, 2004). As with SO₂ emissions, a cap on NO_x emissions will likely result in no physical emissions effects from equipment efficiency standards. However, there is an NO_x benefit from conservation in the form of a lower allowance price as a result of additional allowances from this rule, and, if it is big enough to be calculable by NEMS-BT, DOE will report this value.

3.0 RESULTS

The results for the environmental analysis are similar to a complete NEMS run, as published in the *AEO2003*. These include power sector emissions for SO₂, NO_x, and carbon, and SO₂ prices, in five-year forecasted increments extrapolated to the year 2035. The Department reports the outcome of the analysis for each trial standard level as a deviation from the *AEO2003* reference cases.

REFERENCES

1. U.S. Department of Energy-Energy Information Administration, *Annual Energy Outlook 2003, January 2003*. Washington, DC. Report No. DOE/EIA-0383(2003).